APPENDIX OF PENDING CLAIMS

1. (Amended) An integrated circuit manufacturing system comprising:

(a) a plurality of interrelated integrated circuit manufacturing tools capable of operating in parallel on a plurality of semiconductor wafers;

(b) a modular optical inspection system including

a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer,

a mechanism for moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another, and

a master processor configured to process data delivered from at least some of the modular inspection subsystems, wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular inspection subsystem; and

(c) a handling tool for moving the semiconductor wafers among the plurality of manufacturing tools and the inspection system.

2. The integrated circuit manufacturing system of claim 1, wherein the plurality of interrelated integrated circuit manufacturing tools comprise a cluster tool.

3. The integrated circuit manufacturing system of claim 1, wherein the modular optical inspection system is disposed proximate a cooling stage of the plurality of interrelated integrated circuit manufacturing tools.

4. The integrated circuit manufacturing system of claim 3, wherein the modular optical inspection system is disposed above a window of one of the integrated circuit manufacturing tools.

5. The integrated circuit manufacturing system of claim 1, wherein each of the modular inspection subsystems has a field of view spanning a fraction of the width of the semiconductor wafer.

6. In an integrated circuit manufacturing system including a plurality of interrelated integrated circuit manufacturing tools capable of operating in parallel on a plurality of semiconductor wafers, a method of inspecting a semiconductor comprising:

transferring the semiconductor wafer from one of the plurality of manufacturing tools to a modular optical inspection system including a plurality of modular inspection subsystems each configured to detect defects on a portion of the semiconductor wafer; and

moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another such that each of the modular inspection subsystems inspects, in a single pass across the semiconductor wafer, an associated region of the semiconductor wafer.

7. The method of claim 6, wherein the plurality of interrelated integrated circuit manufacturing tools comprise a cluster tool.

8. The method claim 6, wherein the modular optical inspection system is disposed above a window of a cooling tool of the plurality of interrelated integrated circuit manufacturing tools.

9. A modular optical inspection system for inspecting a surface, the inspection system comprising:

a plurality of modular inspection subsystems each configured to detect defects on a portion of the surface; and

a mechanism for moving at least one of the surface and the plurality of modular inspection subsystems with respect to one another, wherein at least one of the plurality of modular inspection subsystems includes

(i) a two-dimensional sensor configured to receive light from the surface; and

(ii) a controller configured to control the relative speeds at which

data is read from the sensor and

the modular inspection subsystem and the surface are moved with respect to one another

such that the surface is imaged in a time-delay integration mode.

10. The modular optical inspection system of claim 9, wherein all of the plurality of modular inspection subsystems include separate sensors and separate controllers.

11. The modular optical inspection system of claim 9, wherein each of the modular inspection subsystems has a field of view spanning a fraction of the width of the surface.

12. The modular optical inspection system of claim 9, wherein the controller causes one row of pixel data to be read from the two-dimensional sensor each time the at least one inspection subsystem moves by one pixel length with respect to the surface.

13. The modular optical inspection system of claim 9, wherein the two-dimensional sensor includes at least one of a CCD array.

14. The modular optical inspection system of claim 9, wherein at least one of the modular inspection subsystems comprises an illuminator capable of emitting light at a wavelength of no greater than about 500 nm.

15. The modular optical inspection system of claim 9, wherein at least one of the modular inspection subsystems comprises a coherent light source selected from the group consisting of diode lasers, Helium Neon lasers, Argon lasers, and frequency doubled YAG lasers.

16. The modular optical inspection system of claim 9, wherein at least one of said modular inspection subsystems contains an ellipsometer configured to measure the thickness of a layer on the surface.

17. A modular optical inspection system for inspecting a surface, the inspection system comprising:

a plurality of modular inspection subsystems each configured to detect defects on a portion of the surface;

a mechanism for moving at least one of the surface and the plurality of modular inspection subsystems with respect to one another; and

a master processor configured to process data delivered from at least some of the modular inspection subsystems,

wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular inspection subsystem.

18. The modular optical inspection system of claim 17, wherein all of the plurality of modular inspection subsystems include separate local processors.

19. The modular optical inspection system of claim 18, wherein the master processor is connected to each of the separate local processors.

20. The modular optical inspection system of claim 17, wherein each of the modular inspection subsystems has a field of view spanning a fraction of the width of the surface.

21. The modular optical inspection system of claim 17, wherein the local processor comprises a digital signal processor.

22. The modular optical inspection system of claim 17, wherein local processor implements an algorithm that distinguishes valid pattern scattering from defect scattering on the surface.

23-42 Canceled.